



HUNTSVILLE

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Engineering Division

MAPLE HILL CEMETERY ADDITION

Project No. 65-14-SP01

October 3, 2014

Addendum #6

PART 1 - GENERAL

SCHEDULE 0 - The following additions, deletions, clarifications and/or changes to the drawings and specifications shall be fully incorporated therein and becomes a binding part thereof.

SCHEDULE 1 - Bidder shall be responsible for information contained herein and no allowance will be made for lack of knowledge concerning all addenda issued for this project.

PART 2 - DAYS IN CONTRACT

Change number of days in contract from 180 to 270.

PART 3 - SPECIAL PROVISIONS

SCHEDULE 0 - Special Provisions 3000, 4000, 6000, 7000, & 8000 are added to the project and attached hereto.

PART 4 - GEOTECH SUPPLEMENTAL LETTER

SCHEDULE 0 - Supplemental letter on Pavement Design Recommendations, dated March 19, 2014, is added to the project and attached hereto.

The Star of Alabama

PART 5 - CLARIFICATIONS

SCHEDULE 0 - Traffic Control. Contractor is to supply, maintain & remove any and all necessary Traffic Control devices (cones, barrels, barricades, etc...) for construction of project. At minimum, contractor should expect to barricade 12 internal cemetery driveways simultaneously during construction. All Traffic Control devices and their placement is to be coordinated with and approved by owner prior to placement, so as to anticipate access for funerals. All traffic control is a subsidiary obligation to Base Bid, item #1, and no separate pay item will be used.

SCHEDULE 1 - Rock Excavation for payment under Base Bid, item # 3, shall be defined and measured as follows:

- A. **Rock Definition:** Owners Geotechnical Engineer, OMI, shall be notified and present during any rock classification and rock excavating. Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cubic yard for bulk excavation $\frac{3}{4}$ cubic yard for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, or ripping:
 - 1. **Equipment for Footing, Trench, and Pit Excavation:** Late-model, track-mounted hydraulic excavator; equipped with a 42-inch maximum-width, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom.
 - 2. **Equipment for Bulk Excavation:** Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket.
- B. **Rock Measurement:** Volume of rock actually removed, measured in original position, but not to exceed the following:
 - 1. 12 inches outside of concrete forms at footings.
 - 2. 6 inches outside of minimum required dimensions of concrete cast against grade.
 - 3. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
 - 4. 6 inches beneath bottom of concrete slabs-on-grade.
 - 5. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe.

SCHEDULE 2 - Concrete Header where shown on the plans shall be per COH Standard Details, Detail ST-203.

SCHEDULE 3 - Topsoil. Delete the Topsoil answer under Questions, Schedule 13 of Addendum #5, and replace with the following answer: Topsoil is defined and specified in Special Provision 4000. Contractor is to supply, place and lightly compact a 4" thick (compacted) course of approved off-site topsoil borrow on all disturbed ground surfaces not otherwise treated.

SCHEDULE 4 - All work or materials not classified as an Option in the construction documents, shall be understood to be constructed / installed / supplied in Base Bid, bid item # 1 unless indicated otherwise in construction documents.

PART 6 - ADDITIONAL QUESTIONS

SCHEDULE 0 - Addendum #5 referenced adding a unit price item for rock removal. I did not see any updated quantities in the addendum. Can a rock item be set up as a unit quantity? This is shown on bid form, base bid item #3.

SCHEDULE 1 - Also the dumpster enclosure was eliminated? I assume that the item will be eliminated as well? The dumpster enclosure was eliminated and plans revised reflecting such on Addendum #3. The Bid Form (Quantities) reflects the change under Option #4.

SCHEDULE 2 - The additional chained off railing in addendum 5. Is this to be included in the base bid? Yes.

SCHEDULE 3 - Will the added irrigation system have a separate pay item? No, irrigation system is to be paid for under Base Bid item #1, see the description of this bid item on the Bid Form (Quantities).

All addenda and attachments for the above-referenced project will become part of the contract documents. **All addenda must be acknowledged either on the outside of the bid envelope or on the second page of your bid proposal known as Attachment "B".**

Attachments: Special Provision 3000
Special Provision 4000
Special Provision 6000
Special Provision 7000
Special Provision 8000
Copy of Letter - OMI

END OF ADDENDUM #6

**SPECIAL PROVISION 3000
LAWNS AND GRASSES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Sodding

1.3 DEFINITIONS

- A. Finish Grade: Elevation of finished surface of soil for all sod areas. Finish grade is soil surface of sod; i.e., soil cut with sod, when placed, becomes finish grades
- B. Subgrade: Surface or elevation of subsoil remaining after completing excavation prior to placing topsoil to specified thickness.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of each seed mixture for sod, identifying source, including name and telephone number of supplier.
- C. Qualification Data: For landscape installer.
- D. Material Test Reports: For all topsoil sources.
- E. Planting Schedule: Indicating anticipated planting dates for each type of planting.
- F. Maintenance Instructions: Recommended procedures from contractor to be used by owner for maintenance of lawns during a calendar year.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.
 - 1. Installer's Field Supervision: Require installer to maintain an experienced full-time supervisor on project site when planting is in progress.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory recognized by the State Department of Agriculture with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Topsoil and Off-Site Borrow Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt and clay content; deleterious material, pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus and potash nutrients and soil amendments to be added to produce satisfactory topsoil. Supply and install all soil amendments as required to attain acceptable topsoil at no additional cost to owner.
2. Submit soil analysis for all off-site & on-site topsoil proposed to be used on site. This shall be at no additional cost to owner.
3. All soil reports shall be submitted for review and approval by landscape architect prior to any topsoil work.

1.6 DELIVERY, STORAGE AND HANDLING

Sod shall be installed within 24 hours of cutting. Sod delivered to site shall be immediately installed on prepared subgrade. Subgrade shall be observed and accepted by Landscape Architect prior to placing sod. Handle sod per Section 654, Alabama Department of Transportation (ALDOT) Standard Specifications.

1.7 SCHEDULING

- A. **Planting Restrictions:** Do not install sod on an unacceptable subgrade.
- B. **Weather Limitations:** Proceed with planting only when existing and forecasted weather conditions permit.

1.8 LAWN MAINTENANCE

- A. Begin maintenance immediately after each area is sodded and continue until acceptable sod is established but for not less than thirty days.
- B. Maintain and establish sod by watering, fertilizing, weeding, mowing, trimming, replanting and other operations. Roll, regrade and replace to produce a uniformly smooth lawn.
- C. **Watering:** Provide and maintain temporary piping, hoses and lawn-watering equipment to convey water from sources to keep lawn uniformly moist.
 1. Schedule watering to prevent wilting, puddling, erosion and displacement of sod.
 2. Water sod as required for establishment.
- D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain 1" height without cutting more than 40 percent of grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height: 1".

PART 2 - PRODUCTS

2.1 SOD

- A. **Sod:** Certified, Number 1 quality. Furnish viable sod of uniform density, color, and texture, strongly rooted and capable of vigorous growth and development when planted. Submit following information for approval prior to purchase / installation of sod: sod grower/supplier, sod farm location, sod farm contact information, sod installer, sod installer qualifications. Owner and Landscape Architect shall inspect sod at sod farm prior to cutting of sod for this project.

- B. Sod Species: 419 Bermuda. Provide fresh, clean, new crop sod complying with tolerance for purity and established by Official Seed Analysts of North America. Sod shall be supplied in 42" wide rolls; strip sod shall only be acceptable where rolls are not practicable (in the opinion of the Landscape Architect).

2.2 TOPSOIL

- A. Topsoil: See Special Provision 4000.

2.3 INORGANIC SOIL AMENDMENTS

- A. Lime: See Special Provision 4000.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive sod for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected and engineer has approved subgrade.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements and other facilities, trees, shrubs and plantings from damage caused by planting operations.
- B. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff of airborne dust to adjacent properties and walkways.

3.3 GROUND PREPARATION

- A. Limit lawn subgrade preparation to areas to be planted.
- B. Prepare ground per ALDOT Section 651.

3.4 SODDING

- A. Lay sod within 24 hours of cutting. Do not lay sod if ground is frozen or muddy. Landscape Architect must approve subgrade prior to installation.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
- C. Install sod per ALDOT Section 654.
- D. Saturate sod with fine water spray after planting. During first week, water daily or more frequently as necessary to maintain moist soil.

3.5 SATISFACTORY LAWNS

- A. **Satisfactory Sodded Lawn:** At end of maintenance period, a healthy, well-rooted, even colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. **Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.**

3.6 CLEANUP AND PROTECTION

- A. **Promptly remove soil and debris created by lawn work from paved areas.**
- B. **Erect barricades and warning signs as required protecting newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.**
- C. **Remove erosion-control measures after grass establishment period.**

END OF SECTION

SPECIAL PROVISION 4000

LANDSCAPE WORK

PART 1 - GENERAL

1.01 Related Drawings

Drawings and general provisions of the contract, including General and/or Supplementary Conditions and Division 1 Specification Sections, apply to the work of all technical sections.

1.02 Description of Work

- A. Extent of the landscape work is shown on drawings and in schedule.
- B. Provide and furnish all labor, materials and equipment required or inferred from drawings and specifications to complete the work of this section.

1.03 Quality Assurance

A. Reference Standards

- 1. Standardized Plant Names, latest edition by the American Joint Committee on Horticultural Nomenclature.
- 2. American Standard for Nursery Stock, latest edition, by the American Association of Nurserymen.

B. Source Quality Control

- 1. General: Only plant material grown in a recognized nursery in accordance with good horticultural practice will be accepted. Location source of trees shown on plans. Provide healthy, vigorous stock, free of disease, insects, eggs, larvae and defects such as knots, included bark, injuries, abrasions or disfigurement.
- 2. Inspection of plant material prior to digging: The contractor shall locate all plant material for the job and inform the landscape architect in writing of the supplying nursery, contact name, and phone number within 7 days of award of contract to General Contractor. The landscape architect and the owner will select and tag 100% of the plant materials required for the job at the contractor's sources. In the event plant material is found to be unacceptable, the contractor will pursue other listed sources until acceptable plant material is found, at no additional cost to the owner.

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LANDSCAPE WORK

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Approval at the plant source does not impair the right of inspection and rejection during progress of the work. Contractor shall pay all deposits necessary for purchase of all trees direct to nursery.

3. Ship the landscape materials with certificates of inspection required by governing authorities. Inspection by federal and/or state governments at the grower does not preclude rejection of plants at the site by the landscape architect. Comply with regulations applicable to landscape materials. Prepare plants for shipment to prevent damage to the plants.
- C. Do not make substitutions: If specified landscape material is not obtainable, submit to the landscape architect proof of non-availability and proposal for use of equivalent material. For proof of non-availability submit a written statement from listed nurseries that the plant in question is not available from them.
- D. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
- E. Topsoil: Before delivery of topsoil (approval of topsoil required prior to delivery), furnish the landscape architect with written reports, samples and statements giving location of properties from which topsoil is to be Obtained, depth to be stripped, and crops grown during past 2 years.
- F. Soil Report: The contractor shall engage a reputable soils laboratory to include testing and analysis of new offsite topsoil. In the report, list fertilization and soil amendment recommendations to insure vigorous growth for all plants specified. Also include PH of soil samples and *any* lime requirements. Any material and labor required to amend topsoil to meet specifications are a subsidiary obligation and no additional compensation will be paid.
- G. Approval and Selection of Materials and Work: The selection of all materials and the execution of all operations required under the specifications and drawings are subject to the approval of the landscape architect and the owner. They have the right to reject *any* and all materials and *any* and all work which, in their opinion, does not meet the requirements of the contract documents at *any* stage of the operations. The contractor shall remove rejected work and/or materials from the job site and replace promptly.

1.04 Submittals

- A. Certification: Prior to acceptance of materials, submit certificates of inspection as

required by government authorities and manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.

- B. **Planting Schedule:** Submit planting schedule showing scheduled dates for each type of planting in each area of site prior to beginning of the work.
- C. **Maintenance Instructions:** Upon completion of the installation, submit typewritten recommendations for maintenance of all portion of the landscape.
- D. **Topsoil Sample:** Submit 1 cubic foot sample of offsite topsoil
- E. **Soil Report:** Submit results of laboratory soil tests minimum of seven days prior to beginning of the work.
- F. **Approval:** Obtain approval from the landscape architect for all submittals prior to beginning of work unless otherwise noted.

1.05 Delivery, Storage and Handling

- A. **Packaged Materials:** Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery and while stored at site. (Plants shall not be transported in temperatures below 20°F).
- B. **Sod:** See Special Provision 3000.
- C. **Trees, Shrubs and Ground Cover:** Do not prune prior to delivery. Do not bend or bind-tie trees or shrubs in such a manner as to damage bark, break branches or destroy natural shape. Provide protective covering during shipment.
- D. **Deliver trees, shrubs and ground cover** after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees, shrubs and ground cover in shade, protect from weather and mechanical damage, heal in with mulch and keep moist.
- E. **Do not remove container grown stock from containers until planting time.**
- F. **Do not remove labels attached to plant material by the landscape architect until directed to do so.**

1.06 Job Conditions

- A. Proceed with and complete the landscape work as rapidly as portions of site become available, working within seasonal limitation for each kind of landscape work required.
- B. Existing Utilities: Determine location of underground utilities. Perform work in a manner which will avoid possible damage. Excavate as required. Maintain grade stakes set by others unless removal is mutually agreed upon by parties concerned. All damage to utilities resulting from work covered in these specifications will be repaired at the contractor's expense.
- C. Excavation: If conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify the landscape architect in writing before planting. Contractor, shall include In base bid all additional off-site topsoil necessary for planting on this site.
- D. Planting Time: Plant or install materials during suitable weather conditions.
- E. Planting Schedule: Prepare a proposed planting schedule. Schedule dates for each type of landscape work during contract period. Coordinate schedule with the General Contractor. No planting of trees shall be allowed between March 15 and July 1. Planting of trees between July 1 and October 30, shall be by special permission from Landscape Architect and only allowed if Contractor has forces on site every day watering and monitoring moisture levels in the balls.
- F. Coordination with Lawns: Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to the landscape architect. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

1.07 Warranty

- A. Warranty all trees, shrubs, groundcover, and areas for a period of 1 year after date of final acceptance, against all defects, including death and unsatisfactory growth, in the opinion of the landscape architect and or the owner, except for defects resulting from incidents which are beyond the landscape contractor's control.
- B. Remove immediately and replace all trees, shrubs, groundcovers and lawn or other plants found to be dead or in unhealthy condition during the guarantee period as determined by the landscape architect or the owner. Make replacements as soon as weather conditions permit.
- C. Replacements: Match (height, spread and caliper) adjacent specimens of the same species. Replacements are subject to all requirements stated in this specification and subject to inspection by the landscape architect prior to digging.

- D. Repair grades, lawn areas, paving and any other damage resulting from replacement planting operations at no additional cost to the owner.
- E. Inspect job site monthly during the guarantee period to determine what changes, if any, should be made in the maintenance program. Submit all recommended changes in writing to the landscape architect and the owner.

PART 2 - PRODUCTS

2.01 Topsoil

Provide off site topsoil which is free of purple nut sedge, fertile, friable, natural loam, surface soil, free of subsoil, clay lumps, brush, weeds and other litter and free of roots, stumps, stones larger than 1/2" in any dimension, and other extraneous or toxic material harmful to plant growth. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than 4"; do not obtain from bogs or marshes.

2.02 Soil Amendments

- A. Lime: Natural limestone containing not less than 85% of total carbonates, ground so that not less than 90% passes a 10 mesh sieve and not less than 50% passes a 100 mesh sieve.
- B. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing the following percentages of available plant nutrients:
 - 1. For trees and shrubs, provide fertilizer with not less than 10% available phosphoric acid and from 3% to 5% total nitrogen and from 3% to 5% soluble potash.
 - 2. For lawns, provide fertilizer with not less than 4% phosphoric acid and not less than 2% potassium and a percentage of nitrogen required to provide not less than 1 pound of actual nitrogen per 1,000 square feet of lawn area. Provide nitrogen in a form that will be available to lawn during initial period of growth.

2.03 Planting Soil

See Plan

2.04 Plant Materials

- A. General

1. Provide plants true to species and variety, complying with recommendations of ANSI Z60.1 Standard for Nursery Stock.
2. Specific requirements concerning plant material and the manner in which it is to be supplied are shown on the drawings and plant list.
3. Acclimatization: Plant must have grown under climatic conditions (temperature extremes similar to those of the locality of the project site for a minimum of 1 year immediately prior to being planted on the job.

B. Quality and Size

1. Trees shall be of the size and kind designated by the plans, have a straight trunk with a well-branched, symmetrical top and with leader intact. Trees shall have no fresh cuts of limbs over 3/4 inch which have not completely callused over, no cut back trees and no abrasions of the bark. Trees with co-dominant leaders, narrow crotches with included bark, split bark with in-rolled callus, dead, broken or flush cut branches will not be accepted. All trees shall be straight trunk, with full heads and symmetrical branches around trunk. For multi-stemmed trees no division of the trunk more than 6 inches from the ground level shall be considered as a stem. Trees injured in transit or delivered in an unsatisfactory manner will be rejected. Trees must have good fibrous root systems. All root cuts must be cleanly cut.
2. Balled and burlaped trees (B&B) shall be adequately balled with firm, natural balls of Size in accordance with the American Standards for Nursery Stock (current edition). Balls shall be firmly wrapped with burlap.
3. Balled and burlaped in wire basket trees (W.B., B&B) shall have a machine dug ball. The size and condition of the ball shall be as provided for balled and burlaped trees. The ball shall be dug with a tree spade and placed in a burlap lined wire basket in one operation. The wire basket shall then be crimped around the sides and firmly tied and laced across the top of the burlap covered ball securing the ball and wire basket neatly together. A lifting strap shall then be laced and integrally tied into the wire basket prior to moving the tree from the growing field. Additionally, the trunk of the tree shall be protected by a stem guard installed at time of digging ball which shall be burlap, cardboard, etc., wrapped around the trunk or canes of the tree from the top of the root ball to the first tree branches or 36".
4. Shrubs shall be of the size and kind designated by the plans. Balled and burlaped shrubs shall be vigorous, well furnished plants of uniform size, shape and quality and must have fibrous root systems. Balls shall be firm,

of size in accordance with American Standard for Nursery Stock (current edition), tied with twine or other satisfactory material. No balled shrub will be acceptable if cracked or broken before or during the process of planting and no plant will be acceptable which is handled by the plant top itself and not the ball. Container shrubs shall have a strong fibrous root system established in container soil mix. Plants with root mass circled around inside of container exhibiting a root-bound condition will be rejected.

5. Vines and perennials shall be of the size and kind designated by the plans. Bare-root vines shall be vigorous, well furnished plants with good vigorous root systems, protected by an acceptable method from drying out. Pot-grown plants (P.G.) shall be vigorous well-developed plants, well established in pots with sufficient roots to hold the earth together intact after removal from containers and at the same time not to be root bound. Upon permission of the engineer due to lateness of planting in the spring season causing a hold-over of the planting of vines to the next season, the contractor may furnish and plant potted plants or the kinds of vines designated as bare-root, provided the potted plants are at least one year old, the pots 2-1/2 inch minimum diameter, and 2 plants for the one ordered are furnished and planted in the same pocket holes or beds as specified. The 2 plants will be at no additional cost to the owner. Balled and burlaped vines shall be vigorous, well-developed plants. Perennials shall be field grown unless otherwise provided.

6. Grass Sod: See Special Provision 3000.

2.05 Miscellaneous Landscape Materials

- A. Anchors: Arbortie AT HD15 heavy duty screw anchor .
- B. Arbortie system, color green. Submit manufacturer data for approval.

PART 3 - EXECUTION

3.01 Preparation

General

1. The contractor shall examine conditions under which planting is to be installed. Review applicable architectural and engineering drawings and be familiar with alignment of underground utilities before digging.
2. Planting Time: See Subsection 1.06(E).

3. Layout individual tree and shrub locations and areas for multiple plantings. Stake locations and outline areas and secure the landscape architects' acceptance before start of excavation for planting work. Make adjustments as *may* be requested.
4. Notify the landscape architect of adverse subsurface drainage or soil conditions.

3.02 Excavation

A. Excavation for Trees and Shrubs:

1. Excavate pits, beds and trenches with vertical sides as specified and as shown on the drawings.
2. For balled and burlaped (B&B or B&BIWB) trees, make excavation as shown on details.
3. For container grown stock, excavate as detailed.

3.03 Preparation of Planting Soil

- A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.
- B. Mix lime and fertilizers with topsoil at rates specified. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.
- C. For pit and trench type backfill, mix planting soil prior to backfilling.
- D. For planting beds, mix planting soil either prior to planting or apply to surface of topsoil and mix thoroughly before planting.
 1. Mix lime, if required, with dry soil prior to mixing of fertilizer.
 2. Apply phosphoric acid fertilizer (other than that constituting a portion of complete fertilizers) directly to the sub grade before applying planting soil and tilling.
- E. Loosen sub grade to a minimum depth of 8". Remove stones over 1" in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation.
- F. Place approximately 1/2 of total amount of new topsoil required. Work into top of loosened sub grade to create a transition layer and then place remainder of the planting soil mixture to a minimum depth required to meet lines, grades and elevations shown, after light rolling and natural settlement.

- G. Allow for sod thickness in areas to be sodded.
- H. Grade areas to a smooth even surface with loose, uniformly fine texture. Roll and rake and remove ridges and fill depressions as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
- I. Fertilize and lime prior to start of grassing operation. Apply ground limestone at the rate recommended by soil test analysis and work into top 6" of soil. Apply fertilizer at the rate of 1,200 pounds per acre and work into top 2" of soil.

3.04 Planting Trees and Shrubs

- A. Set ball and burlaped (B&B or B&BIWB) and container stock, plumb and in center of pit or trench with top of ball 2" to 3" above the finish grade (or as shown in details) and also 2" to 3" above the grade they bore to natural grades before transplanting. Remove burlap from top of balls. Remove all synthetic ropes from root ball. Use planting soil mixture to backfill plant pits. When plants are set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.
- B. Form Shallow saucers to the finished grade outside the tree pit (trees not in planting beds or in tree grates) approximately 3" height capable of holding water around each plant by placing a mound of topsoil around the edge of each filled in pit.
- C. If trees or shrubs are moved in full leaf, spray with anti-desiccant at nursery before moving and again after planting as per manufacturers recommendations. Plants shall be hardened off under mist at nursery prior to delivery. Use only if plants are transplanted from June through September. If planting in full leaf, contractor shall seek approval of landscape architect prior to any work.
- D. Mulching: Immediately after planting work has been completed, mulch pits, trenches and planting beds.
- E. Water: Soak all plants immediately after planting, continue watering thereafter as necessary or as directed until acceptance of the work in total. Install and use drip irrigation, gator bags and manual watering. Owner has up to 5 tripod irrigation heads available for use in watering sod by contractor on this project; contact Brian Walker, Landscape Management for access to this equipment.
- F. Smooth planting areas to conform to specified grades after full settlement has

occurred and mulch has been applied.

- F. Shovel edge required between all planting beds and lawn areas.

3.05 Staking, Guying and Pruning

- A. Stake and guy trees immediately after planting. Plants shall be plumb after staking or guying. Maintain stakes, wires and guys until acceptance of the work in total.
- B. Staking trees of 1" to 5" caliper: Drive stakes securely into ground and fasten to tree with arbortie. Adhere to staking details unless alternate detail has been approved by the landscape architect prior to beginning of planting operation.
- C. Pruning: Unless otherwise directed by the Architect, do not cut tree leaders and remove only injured or dead branches from trees, if any. Prune shrubs at the direction of the landscape architect.
- D. Remove and replace promptly any plants misformed resulting from improper pruning.

3.06 Sodding Turf Grass

See Special Provision 3000.

3.07 Maintenance

- A. Begin maintenance immediately after planting.
- B. Maintain trees and shrubs until provisional acceptance of the work in total.
- C. Maintain trees and shrubs by water, pruning, cultivating, weeding and re-mulching as required for healthy growth. Restore planting saucers. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required. Spray as required to keep trees and shrubs free of insects and disease.

3.08 Clean Up and Protection

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Upon completion of work, clear grounds of debris superfluous materials and all equipment. Remove from site to satisfaction of the landscape architect and the owner.
- C. Protect landscape work and materials from damage due to landscape operations,

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LANDSCAPE WORK

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operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed at no additional cost to the owner.

3.09 Inspection and Acceptance

- A. Upon completion of work, notify the landscape architect and the owner at least 10 days prior to requested date of inspection for provisional acceptance. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by the landscape architect and found to be acceptable. Remove rejected plants and materials promptly from project site.
- B. Final acceptance: *One* year after provisional acceptance of the work in total the landscape architect and the owner shall inspect the work for final acceptance.
- C. All planting and plant material required in these specifications shall be in satisfactory condition and accepted by the owner when the contractor applies for final payment.

END OF SECTION

**SPECIAL PROVISION 6000
CONCRETE PAVERS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Interlocking Concrete Paver Units manually installed.
 2. Bedding and Joint Sand.
 3. Edge Restraints.
 4. Cleaner, Sealers, and Joint sand stabilizers.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. ASTM C 33, Standard Specification for Concrete Aggregates.
 2. ASTM C 136, Standard Test Method for Sieve Analysis of Fine and Course Aggregates.
 3. ASTM C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
 4. ASTM C 144, Standard Specification for Aggregate for Masonry Mortar.
 5. ASTM C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
 6. ASTM C 979, Standard Specification for Pigments for Integrally Colored Concrete.
 7. ASTM D 698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,000 ft-lbf/ft³ (600 kN-m/m³)).
 8. ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
 9. ASTM C 1645, Standard Test Method for Freeze-thaw and De-icing Durability of Solid Concrete Interlocking Paving Units.
 10. ASTM D 2940, Specification for Graded Aggregate Material for Bases or Sub-bases for Highways or Airports.
- B. Interlocking Concrete Pavement Institute (ICPI):
1. ICPI Tech Spec Technical Bulletins

1.03 SUBMITTALS

- A. In accordance with Conditions of the Contract and Submittal Procedures.
- B. Sieve analysis per ASTM C 136 for grading of bedding and joint sand.
- C. Concrete pavers:
1. [Four] representative full-size samples of each paver type, thickness, color, finish that indicate the range of color variation and texture expected in the finished installation. Color(s) selected by Landscape Architect and Owner.
 2. Accepted samples become the standard of acceptance for the work.
 3. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936 requirements for compressive strength, absorption and freeze thaw only.
 4. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.
- D. Paver Installation Subcontractor:
1. A copy of Subcontractor's current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.
 2. Job references from projects of a similar size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.

1.04 QUALITY ASSURANCE

- A. Paving Subcontractor Qualifications:
 - 1. An installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.
 - 2. An installer holding a current certificate from the Interlocking Concrete Pavement Institute Concrete Paver Installer Certification program.
- B. Mock-Ups:
 - 1. Install a 5 ft x 5 ft paver area.
 - 2. Use this area to determine surcharge of the bedding sand layer, joint sizes, lines, laying pattern(s), color(s) and texture of the job.
 - 3. This area will be used as the standard by which the work will be judged.
 - 4. Subject to acceptance by owner, mock-up may be retained as part of finished work.
 - 5. If mock-up is not retained, remove and properly dispose of mock-up.

1.05 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact.
 - 1. Coordinate delivery and paving schedule to minimize interference with normal use of buildings adjacent to paving.
 - 2. Deliver concrete pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
 - 3. Unload pavers at job site in such a manner that no damage occurs to the product.
- D. Storage and Protection: Store materials protected such that they are kept free from mud, dirt, and other foreign materials. Store concrete paver cleaners and sealers per manufacturer's instructions.
 - 1. Cover bedding sand and joint sand with waterproof covering if needed to prevent exposure to rainfall or removal by wind. Secure the covering in place.

1.06 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Do not install sand or pavers during heavy rain or snowfall.
 - 2. Do not install sand and pavers over frozen base materials.
 - 3. Do not install concrete pavers on frozen or saturated sand.

1.07 MAINTENANCE

- A. Extra Materials: Provide minimum, 20 pieces (of each type and color paver) of additional material for use by owner for maintenance and repair.
- B. Pavers shall be from the same production run as installed materials.

PART 2 PRODUCTS

2.01 INTERLOCKING CONCRETE PAVERS

- A. Manufacturer: Pavestone Company 800-245-7283
 - 1. Contact: Jason Autry, 770-306-9691.
- B. Interlocking Concrete Pavers:
 - 1. Paver Type: Holland Stone, Concrete Paver.
 - a. Material Standard: Comply with material standards set forth in ASTM C 936
 - b. Color and finish: Owner and Landscape Architect shall select standard colors and standard finishes. Submit product data/color charts.
 - c. Color Pigment Material Standard: Comply with ASTM C 979.
 - d. Size: All pavers shall be 2 3/8 inch thick.
 - e. Average Compressive Strength (C140): 8000 psi (55 MPa) with no individual unit under 7200 psi (50 MPa) per ASTM C 140.
 - f. Average Water Absorption (ASTM C 140): 5% with no unit greater than 7%.
 - g. Freeze/Thaw Resistance (ASTM C 1645): 25 freeze-thaw cycles with no greater

loss than 200 g/m² of paver surface area or no greater loss than 500 g/m² of paver surface area after 50 freeze-thaw cycles. Freeze-thaw testing requirements shall be waived for applications not exposed to freezing conditions.

2.02 PRODUCT SUBSTITUTIONS

- A. Product Substitutions: No substitutions shall be submitted.

2.03 BEDDING AND JOINT SAND

- A. Provide bedding and joint sand as follows:
1. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
 2. Do not use limestone screenings, stone dust, or sand for the bedding sand material that does not conform to the grading requirements of ASTM C 33.
 3. Do not use mason sand or sand conforming to ASTM C 144 for the bedding sand.
 4. Where concrete pavers are subject to vehicular traffic, utilize sands that are as hard as practically available.
 5. Sieve according to ASTM C 136.
 6. Bedding Sand Material Requirements: Conform to the grading requirements of ASTM C 33 with modifications as shown in Table 1.

Table 1
Grading Requirements for Bedding Sand
ASTM C 33

Sieve Size	Percent Passing
3/8 in.(9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075 mm)	0 to 1

7. Joint Sand Material Requirements: Techniseal, HP2 Polymeric jointing sand as Provided by Techniseal, 1-800-465-7325. Color selected by Landscape Architect.

2.04 EDGE RESTRAINTS

- A. Provide edge restraints and install where required around the perimeter of all concrete paving units.

2.05 ACCESSORIES

- A. Provide accessory materials as follows:
1. Geotextile Fabric: Amoco or equal.
 2. Cleaners: As found acceptable to paver manufacturer.

PART 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS

- A. ICPI certified installer with acceptable references and project experience of similar size projects.

3.02 EXAMINATION

- A. Acceptance of Site Verification of Conditions:

1. General Contractor shall inspect, accept and certify in writing to the paver installation Subcontractor, that site conditions meet specifications for the following items prior to installation of interlocking concrete pavers.
 - a. Verify that sub-grade elevations conform to specified requirements.
 - b. Verify that geotextiles, if applicable, have been placed according to drawings and specifications.
 - c. Verify that surface tolerances and elevations conform to specified requirements.
2. Do not proceed with installation of bedding sand and interlocking concrete pavers until Sub-grade conditions are corrected by the General Contractor or designated subcontractor.

3.03 PREPARATION

- A. Verify that sub-grade and geotextile is ready to support sand, and pavers and imposed loads.
- B. Edge Restraint Preparation:
 1. Verify edge restraints are per the drawings at the indicated elevations.

3.04 INSTALLATION

- A. Spread bedding sand evenly over the base and screed to a nominal 1 in. thickness, not exceeding 1 1/2 in. thickness. Spread bedding sand evenly over the base and screed rails, using the rails and/or edge restraints to produce a nominal 1 in. thickness, allowing for specified variation in the surface.
 1. Do not disturb screeded sand.
 2. Screeded area shall not substantially exceed that which is covered by pavers in one day.
 3. Do not use bedding sand to fill depressions in the surface.
- B. Lay pavers in herringbone field pattern, with header course around perimeter. Place units hand tight without using hammers. Make horizontal adjustments to placement of laid pavers with rubber hammers and pry bars as required.
- C. No more than 5% of the joints shall exceed 1/4 in. wide to achieve straight bond lines.
- D. Joint lines shall not deviate more than $\pm 1/2$ in. over 50 ft. from string lines.
- E. Fill gaps at the edges of the paved area with cut pavers or edge units.
- F. Cut pavers to be placed along the edge with a double blade paver splitter or a masonry saw.
- G. Adjust bond pattern at pavement edges such that cutting of edge pavers is minimized. All cut pavers exposed to vehicular tires shall be no smaller than one-third of a whole paver.
- H. Keep skid steer and forklift equipment off newly laid pavers that have not received initial compaction and joint sand.
- I. Use a low-amplitude plate compactor capable of at least minimum of 4,000 lbf at a frequency of 75 to 100 Hz to vibrate the pavers into the sand. Remove any cracked or damaged pavers and replace with new units.
- J. Simultaneously spread, sweep and compact dry joint sand into joints continuously until full. This will require at least 4 to 6 passes with a plate compactor. Do not compact within 6 ft of unrestrained edges of paving units.
- K. All work within 6 ft. of the laying face must be left fully compacted with sand-filled joints at the end of each day or compacted upon acceptance of the work. Cover the laying face or any incomplete areas with plastic sheets overnight if not closed with cut and compacted pavers with joint sand to prevent exposed bedding sand from becoming saturated from rainfall.
- L. Remove excess sand from surface when installation is complete.

3.05 FIELD QUALITY CONTROL

- A. The final surface tolerance from grade elevations shall not deviate more than $\pm 1/4$ in. under a 10 ft straightedge.
- B. Check final surface elevations for conformance to drawings.

- C. Lippage: No greater than 1/8 in. difference in height between adjacent pavers.

3.06 [CLEANING] [SEALING] [JOINT SAND STABILIZATION]

- A. Clean concrete pavers in accordance with the manufacturer's written recommendations.

3.07 PROTECTION

- A. After work in this section is complete, the General Contractor shall be responsible for protecting work from damage due to subsequent construction activity on the site.

END OF SECTION

**SPECIAL PROVISION 7000
CITY OF HUNTSVILLE
IRRIGATION SPECIFICATIONS
NON MAXICOM**

GENERAL

PURPOSE

The objective of these specifications is to provide, assemble and install a sprinkler system which will operate in an efficient and satisfactory manner so that the finished system shall efficiently irrigate all areas to be covered and shall prove satisfactory in all aspects to the owner. The specifications, design details, irrigation designs and quotation are to be considered a part of the sprinkler system contract, and it is expected that the chosen contractor will follow specifications with due perseverance.

SCOPE OF WORK

The work required by these specifications consists of all labor, material, equipment, and services required for a complete functioning irrigation system.

The plans and specifications are intended to include everything obviously requisite and necessary to the proper installation of the work whether each necessary item is mentioned herein or not, unless otherwise specified, and the contractor is expected to provide for the same.

All work herein specified or called for on the drawings or in the detail drawings shall be executed in accordance with all governing ordinances, laws and regulations and shall meet all local conditions and any changes and/or additions in work necessary to meet ordinances, laws, regulations and/or conditions will be made without additional expense to the owner, but such changes shall have the prior written approval of the owner.

DEFINITION OF THE INTENT OF DOCUMENTS

The contract agreement, drawings, specifications and quotation constitute the contract documents, and all modifications thereof incorporated in the documents before their execution. What is called for in one document shall be as binding as if called for by all. The intent of documents is to include, unless otherwise stated, all labor and equipment for the completion of the work required for a complete irrigation system in a workmanlike and proper manner.

EXAMINATION AND VERIFICATION OF DRAWINGS AND JOB SITE

Prior to submitting a proposal for this project, each bidder has the responsibility to examine the premises and satisfy himself as to the condition under which he will be obligated to operate in installing the irrigation system under this contract.

All plot dimensions on the irrigation design are approximate. Prior to proceeding with the work, the contractor shall carefully check and verify all dimensions and shall report all variations from those indicated in the irrigation plan to the owner in writing. If changes are to be made, they will be made in accordance with previous provisions.

GUARANTEES

The work included under this contract shall be guaranteed by the contractor against all defects and malfunctions due to faulty workmanship for a period of one year from the date of final acceptance by the owner. Upon being informed by the owner of any defects or malfunctions in workmanship, the contractor shall effect all necessary repairs and/or replacements in a reasonably expedient manner at no additional cost to the owner.

Emergency repairs, when necessary, may be made by the owner without relieving the contractor of his guarantee obligation.

The contractor shall be obligated to repair any settling of backfilled trenches which may occur during the guarantee. The contractor is also obligated to restore any and all damaged planting, paving or improvements within the year period. If the contractor does not respond to the owner's request for repair work within a period of two days, the owner may proceed with such necessary repairs and charge the contractor for all expenses incurred in the repair work.

EQUIPMENT, TOOLS, AND LABOR

The contractor shall provide and pay for all equipment, tools and labor required for the completion of this project. All irrigation meters and backflow preventers, including taps and boxes are by Huntsville Utilities; bidder shall include all fees and costs (material and labor) for same in his lump sum bid price for irrigation.

The contractor shall provide and keep up-to-date a complete set of as-built drawings which shall be corrected daily to show changes in sprinkler locations, controller location, piping locations and other deviations from the original irrigation design drawing as provided to him. All isolation valve locations shall be shown with actual measurements to reference points so they may be located easily in the field. Upon completion of the work, the contractor shall furnish the owner with a complete set of as-built drawings showing the sprinkler system as installed. This is the responsibility of the contractor and shall not be construed to be the responsibility of any other party.

TRAINING OF PERSONNEL

Upon completion of work and acceptance by the owner, the contractor shall be responsible for the training of personnel in the operation, maintenance, and repair of the system. The contractor shall furnish copies of all available parts lists, trouble shooting lists, specification sheets, and catalog sheets to the owner prior to final payment.

The contractor shall set the initial watering schedules and programming of the automatic controllers in accordance with the specifications, irrigation plan or as directed. Changes in the schedules and programming and instruction on how to make such changes shall be the responsibility of the designer or landscape architect of the system.

PROTECTION OF WORK AND PROPERTY

The contractor shall continuously maintain adequate protection of all his work from damage and shall protect the owner's property from injury or loss arising in connection with work on this contract. The contractor shall take care to avoid damage to any existing buildings, equipment, piping, pipe coverings, electrical systems, sewers, sidewalks, landscaping grounds, above ground or underground installations or structures of any kind, and shall be held liable for any damage that does occur. Damage includes not only mechanical damage but from leaks in the irrigation system being installed by the contractor, whether through negligence or otherwise. The contractor shall adequately protect adjacent property as provided by law and shall provide and maintain all passageways, guard fences, lights and other facilities for protection required by the Public Authority for local conditions. The contractor shall securely cover all openings into the section of the system he is working on and components of the system as it is being installed to prevent obstructions in the pipe and the breakage, misuse or disfigurement of the equipment.

HANDLING OF MATERIALS

The contractor shall be responsible for correct procedures in on-site loading, unloading, stacking, transporting, and handling all materials to be used in the system. The contractor shall avoid rough handling which could affect the useful life of equipment. Pipe shall be handled in accordance with the manufacturer's recommendation on loading, unloading, and storage.

CLEANING PREMISES

The contractor shall continuously keep a neat and orderly area in which he is installing the system. Disposal of rubbish and waste material resulting from the installation shall be continual. There shall be NO waste materials or trash allowed in trenches.

MATERIALS

All materials are to be furnished as specified on drawings or in specifications.

SOLVENT CEMENT AND PRIMER

Solvent shall be IPS-721 or pre-approved equal.

Solvent shall be IPS-727 or pre-approved equal, When temperatures are below 40 Fahrenheit.

NOTE: In temperature below 32° Fahrenheit contractor shall not glue any pipe together.

Primer shall be IPS-70 or pre-approved equal.

ELECTRIC REMOTE CONTROL VALVE

See plans.

ELECTRIC REMOTE CONTROL VALVE FOR DRIP

See plans.

SPRINKLERS

See plans.

RAIN GAUGE

See plans..

CONTROL VALVE WIRE SPLICES

These splices will only be made by using 3M-DBR/Y-6 connectors; all splices will either be made in a valve box **only**.

INSTALLATION AND INSPECTION

INSPECTION OF WORK IN PROGRESS

The owner's authorized representative shall be responsible for inspection of the contractor's work which is in progress. A representative may bring to the attention of the

contractor any work which does not meet the specifications of this contract and the contractor shall correct such work as brought to his attention.

STAKING OF SPRINKLER LOCATION

Staking of sprinkler locations shall be done by the contractor and approved by the owner's representative.

EXCAVATION

All excavation shall be unclassified and shall include all materials encountered.

It shall be the responsibility of the contractor to provide suitable backfill materials. This backfill material shall be free from the rocks, large stones and other unsuitable substances which could damage the pipe or create unusual settling problems. The minimum depth of cover over piping 6" and larger shall be 24". The minimum depth of cover over piping 4" and smaller shall be 18". Backfilling will be done in 6" layers and tamped after each layer is put in to prevent excessive settling **in all lines.**

The contractor shall exercise reasonable care to avoid causing damage to any and all underground utilities and structures.

The owner shall advise the contractor of any underground utilities or structure of which he is aware. Utility locating services shall be called upon to pinpoint location of any underground utilities on site of the project by the contractor.

INSTALLATION OF SYSTEM MAIN

Installation of the system main shall be in accordance with the manufacturer's instructions and shall proceed from the point of connection of supply for the system. Concrete thrust blocks shall be installed at any directional change or tee in the pipeline in accordance with the pipe manufacturer's instruction.

INSTALLATION OF LATERAL LINES

Lateral lines may be installed by standard trenching techniques or by "pulling in" pipe. If the pull-in method is used, the pipe "plow" shall be a vibratory type and equipped with a turf roller device to prevent tearing of the "turf". The "Mole" or "Bullet" which precedes the pipe and is used to form the opening for the pipe shall be not less than 1" larger in diameter than the outside diameter of the pipe. Starting and finishing holes shall not exceed a two foot square opening, which the sod removed from such holes is to be preserved and replaced.

Lateral pipes and fittings shall be installed in accordance with the manufacturer's recommendations, including the shaking-in of PVC pipe to prevent excessive strain when contracting in cold weather.

SPRINKLER HEADS

All sprinklers shall be installed on swing joints as shown in detailed drawings. When funny pipe is used for spray heads be sure and use a marlex ell and a barb ell as a swing joint directly below sprinkler head. The sprinkler head shall be installed so that the top is slightly below the finished grade level. If finished grade has not been established, the sprinkler will be extended a minimum of 4" above existing level and marked with a stake to prevent damage by equipment. Back fill around the swing joint and sprinkler shall be free of large rocks, roots, or foreign debris. Hand tamp around heads, so heads do not move.

When finished grade has been established the contractor shall set heads with top slightly below the finished grade level, below sod or sprigs.

NOTICE OF COMPLETION

When the contractor is satisfied that the system is operating properly, that it is balanced and adjusted, that all work and cleanup is completed, he shall issue the notice of completion to the owner's authorized representative. The notice of completion shall include the required for final inspection with date and time given.

FINAL INSPECTION WITH OWNER'S REPRESENTATIVE

The owner's representative will respond to the notice of completion by the contractor and shall appear at the given time for a tour of the project with the purpose of making it the final inspection. Any inconsistencies to the specifications shall be noted by the owner's representative and a written copy of corrections shall be given to the contractor.

ACCEPTANCE OF THE SYSTEM

The owner may accept the system even though the corrections on the final inspection have not been made by the contractor. In such a case, there will be deductions for the uncompleted or uncorrected work based on previous provisions of these specifications. Such deductions shall be made from the final payment.

AS-BUILT PLAN ACCEPTANCE

Acceptance of the system is based on the furnishing by the contractor of two sets of completed as-built plans which is acceptable to the owner or owner's representative.

TRAINING OF MAINTENANCE PERSONNEL IN OPERATION AND MAINTENANCE OF SYSTEM

The contractor's responsibility of training maintenance personnel in the operation and maintenance of the system, as outlined in a previous section of these specifications, shall not be waived due to acceptance of the system. If this responsibility is not fulfilled, the cost of obtaining this training by the owner shall be shown as deduction in the final payment.

WARRANTY AND GUARANTEE CERTIFICATES

The contractor shall furnish a certificate of warranty registration and a guarantee of work for a one year period from date of final acceptance of the system. Depending on the time of completion the contractor will need to winterize the system and start it back up in the spring. Final payment for the system shall not be made unless this certification is presented to the owner.

**SPECIAL PROVISION 8000
TEMPORARY EROSION AND SEDIMENT CONTROL**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary Erosion Control
- B. Temporary Sediment Control

1.2 PERFORMANCE REQUIREMENTS

- A. City of Huntsville Storm Water Management Manual, Chapter 10, Erosion and Sediment Control.
- B. Alabama Department of Environmental Management. (ADEM); NPDES Permit requirements.
- C. Alabama Department of Transportation (ALDOT) Standard Specifications for Highway Construction Latest Edition, Section 665.

1.3 QUALITY ASSURANCE

- A. Conform to ALDOT Standard Specifications for Highway Construction (Latest Edition), Section 665.
- B. Conform to ADEM, NPDES Permit requirements.

1.4 REGULATORY REQUIREMENTS

- A. Conform to ADEM, NPDES Permit.
- B. Conform to City of Huntsville Storm Water Management Manual.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Erosion and sediment control materials shall be as shown on Plan and Details and conform to ALDOT Section 665.

PART 3 EXECUTION

- 3.1 All erosion and sediment control materials shall be installed, maintained and all temporary materials removed from Project when no longer needed, unless shown otherwise on Plans. Removal of temporary materials shall be only after permanent controls are in place and functioning properly.
- 3.2 Coordinate all work with time schedule as shown on Plans.

END OF SECTION

OMI, Inc.

March 19, 2014

Land Design Solutions, Inc.
6996 Linda Street
Huntsville, AL 35811

ATTN: Mr. Mike Donnelly

SUBJECT: Pavement Design Recommendations
Proposed Maple Hill Cemetery Expansion
Huntsville, AL
OMI, Inc. Job No. 6657

Gentlemen:

The following recommendations are based in part on the project information. This study has utilized the subsurface data, published information regarding the structural performance of similar structures and roads, and past experience with similar geologic environments to develop professional opinions on which the recommendations are based.

In the areas of the existing pavement to be retained, an overlay will be needed to carry future traffic. The following table illustrates the design pavement section for areas where existing asphalt and stone base is present directly beneath the pavement section.

PAVEMENT SECTION OVERLAY

PAVEMENT MATERIAL	AUTOMOBILE	TRUCK
ASPHALT SURFACE COURSE (Hot Mix) ALDOT No. 424A, 1/2-in Max. Agg. Size, ESAL Range A/B	1.5 inches	2.0 inches
ASPHALT BINDER COURSE ALDOT No. 424B, 3/4-in Max. Agg. Size, ESAL Range A/B	3.0 inches	4.0 inches
TOTAL THICKNESS	4.5 inches	6.0 inches

In the areas of new road and parking lot construction, the following table illustrates the design pavement section for areas where soil is present directly beneath the pavement section.

PAVEMENT SECTION OVER COMPACTED SOIL

PAVEMENT MATERIAL	AUTOMOBILE	TRUCK
ASPHALT SURFACE COURSE (Hot Mix) ALDOT No. 424A, 1/2-in Max. Agg. Size, ESAL Range A/B	1.0 inch	1.0 inch
ASPHALT BINDER COURSE ALDOT No. 424B, 3/4-in Max. Agg. Size, ESAL Range A/B	2.0 inches	2.0 inches
STONE BASE COURSE ALDOT No. 825 B (Compacted to 100% Standard Proctor as per AASHTO T-99)	5.0 inches	10.0 inches
TOTAL THICKNESS	8.0 inches	13 inches

All pavement materials and construction methods should conform to the guidelines and requirements of the Alabama Department of Transportation. During placement of the aggregate base and asphalt courses, density tests and thickness measurements should be performed to compare the design section to the constructed section. The soil subgrade should be graded to provide a smooth transition from one pavement section to another. It is imperative that truck traffic be limited to areas specifically designed to carry those vehicles.

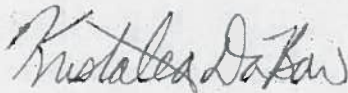
Immediately prior to placement of the aggregate base, the subgrade must be proofrolled to judge the stability of the soil. The soil may require recompaction. The stone base course should only be applied to a stable, compact soil subgrade. Asphalt paving should proceed closely after stone placement. If lengthy delays between stone and asphalt paving occur, the stability of the stone and soil subgrade should be checked prior to paving.

Land Design Solutions, Inc.
OMI Job No. 6657
March 19, 2014
Page 3

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OMI, Inc., appreciates the opportunity to be of service to the Land Design Solutions, Inc. and looks forward to continued involvement with the construction monitoring phase of this project. Please direct any questions concerning this report to the undersigned.

Respectfully submitted,
OMI, Inc.



Kristalea Dabai, E.I.
Staff Engineer



Keith J. Mandel, P. E.
Senior Engineer

Distribution: 1 Copy to Addressee via E-mail: mike.donnelly@mchsi.com

OMI, Inc.